THE ANATOMY OF THE EARTH.

By THO. ROBINSON,
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Ne miremur tam tardè cœli quæ tam altè jacent.
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Edward Cooke.

To the Gentlemen MINERS.

Gentlemen,

I Could not direct this ſmall Treatiſe, unto a more ſuitable Patronage, than by devoting it to your Fraternity; the Contents of it, aiming at the more hidden, as well as viſible Parts of the Earth. And the Opportunities I have had, of being ſometimes Underground, and the Curioſity of making that dark or occult Region, a Subject of Speculation, will I hope, plead my Excuſe, if I attempt Philoſophically to deſcribe thoſe ſeveral Metals, Mines and Minerals, with the different Natures and Qualities of their Feeders,

or Mineral Waters, which a Mechanick relates only by Rott: It is not out of any great Conceit of theſe Notions, that I have been bold to make them publick, or Dedicate them to you; but out of a ſtrong deſire to ſet ſome greater Wits on work, to Improve the Subterranean Philoſophy; and if theſe may but contribute to carry on that Deſign, and have a candid Acceptance, they will encourage me to carry on ſome further Projects I have in hand, which may be diverting at leaſt, if not profitable: I am, in the mean time,

Gentlemen,

Your hearty Well-wiſher

and humble Servant,

Tho. Robinſon.

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THE Anatomy of the Earth.

CHAP. I.

Of the Creation of Matter; the reducing it into Form and Order; and the infusing a Vital Spirit into it.

THE first part that the Almighty created of this *Sublunary World* was *Matter*; which consisted of innumerable Particles of divers Figures and different Qualities, running a Reel in a dark Confusion. In this State they continued, bound up and hamper'd with a vast thick Fogg or Mist of a watrish substance, extending it self as far as the Moon's Vortex, until the *Spirit of God moved upon the Face of the Waters*, or (as the word in the *Hebrew* signifies) *sate on brood* on the rude Mass, and, by vital Heats and Incubations, did digest it into an orderly World: by whose infusing into it, and every part of it, a vital Spirit, it became a great *Animal*; having Skin, Flesh, Blood, Bones, Nerves, &c.

CHAP.

CHAP. II.

Of the Skin *of this Animal; the production of Living Creatures, &c.*

THE Outer Coat and Surface of the Earth is its *Skin*; which (being concocted and digeſted by the influence of the Sun's Beams, and having a *Plaſtick power* infuſed into it by the *Spirit of Nature*) became productive not onely of Graſs, Trees and other Vegetables, as the Skins of other Animals naturally grow hairy; but, when it was in its full ſtrength and vigour, it brought forth all kinds of Birds, Beaſts and Serpents, as naturally as it now brings forth divers kinds of Inſects, or, as the Skins of other Animals bring forth Lice.

For, the influence of the Sun (which the old Philoſophers called the *Spirit of Nature*) ſtriking upon the paſſive Matter, did, by vertue of its plaſtick and vivifick Quality, modifie it into ſuch a Figure, as that it neceſſarily drew down (out of the loweſt Sphere of Life) the Seminal forms of all kinds of Vegetables; as a Load-ſtone draws Iron to it, when it comes within the Sphere of its Activity. Thus all ſorts of Plants began firſt to peep out of the Earth, as Corn out of the Furrows; which, retaining Seed in themſelves, did afterwards propagate their own Species by univocal Generation.

Again; by a Second influence of the Spirit of Nature, this ſame paſſive Matter (but now more enobled) drew down, by way of Sympathy, out of the ſecond Sphere of Life, the Seminal forms of all Beaſts, Birds, Fiſhes and Inſects: which, by the power of their

their Locomotive Faculties, began first to creep out of their Nests of Matter like young Birds with the Shells upon their heads; but, as their strength encreased, soon Crawl'd abroad to feed on such other products of Nature as they found suitable for the support and gratifying of their sensitive Life.

Once more; the same Spirit of God or Nature did modifie Matter into a yet nobler Form; being not onely made capable of receiving the Vegetable and Sensitive Life, but fitted with Organs to entertain an Intellectual Soul: which *Moses* tells us, *God breathed into it*; it being impossible for barely modify'd matter to bring down (by any Sympathy there could be betwixt them) a Soul out of the Intellectual Sphere to inform it. This excellent Creature God was pleas'd to make after his own Image, Spiritual and Immortal; capacitated not onely to be the Governour of this inferior World; but to serve and adore him, his Creator.

The first Individuals of this noble Species were called *Adam* and *Eve*. Yet whether by *Adam* and *Eve* are meant single persons; or a whole Generation of Men and Women, which stock'd all the World at once; or, by *Adam* is to be understood onely the rational and Masculine Faculties of the Soul, and by *Eve* the Feminine and subservient, I leave to those who pretend to knowledge in mystical Philosophy. But perhaps (tho' *Moses* was certainly the greatest Philosopher that ever was in the World, and his account of the Creation be much *ad hominem*, yet) 'tis not safe to vary so far from the literal Sense of the Text. Onely, It may be urged, by way of Argument, that if Blackness be natural to the *Æthiopian*, and Whiteness to the *European*, they

do not derive their Original from one single Person: but, instead of that, it seems probable that the different Soyls, or various Modifications of Matter in several parts of the World, produced Men of different Colours and Complexions. Which may also be the reason why some kinds of Animals are, to this day, peculiar to their own several Countries: whence *Africa* breeds so many venemous Creatures; *Ireland* none; *Athens* Owls, *Crete* none; *Pontus* no Asses; *Scythia* no Swine, &c. and thousands of strange Beasts and Birds are proper to *America*, such as no *Greek*, *Roman* or *Hebrew* Author has ever mentioned, and of which some have thought it reasonable to doubt whether any of their great variety of *Species* ever came in *Noah's* Ark.

The Mountains and Planes being thus replenish'd with Grass, Plants and Fruits; the Forests with Beasts; the Air with Birds; and the Seas and Rivers with Fish; *God cursed the Earth*: that is, so weakened its plastick power, that it could no longer (*proprio motu*) bring forth the more perfect and noble kinds of Creatures. But those inferior and imperfect Animals which we call *Insects* it still affords us, whenever the Matter is so modify'd, by the different degrees of heat, as to be capable of such Productions. Hence the several Months of the Year produce their several sorts of Flyes; as *May-flyes*, *June-flyes* or *Bracken-Clocks*, and the like: Nay, every hour of the day hath its special kind of Flyes, as the heat increases or decreases.

Yea, and (possibly) its voluntary Productions do sometimes arise higher than these. For, in sinking of a Coal-Pit, I have found a large Toad in the closure of a stone near Three fathom under ground;

where

where it could hardly have any other Generation, than what was purely *Spontaneous*, being (as it should seem) produced out of a poysonous Matter enliven'd by the Subterranean heat, and grown to that extraordinary Bulk it carry'd by a continual Attraction of pestilent Vapours, which abound in such dry open Stones as have lost their Feeders.

And as God made all the other Creatures, of an inferiour Rank and Order, for the Use and Service of Man; so all these Monthly, Daily, and Hourly Productions of Insects, &c. are no less for his Benefit. For, as Toads and other venemous Animals suck up those poysonous Vapours, which, if dispers'd through the Earth, would infect the Plants, and prove destructive of humane Health, if not of Life it self; so Flies and other Insects feed upon the Corruptions of the Air, which might otherwise contribute to the causing of many malignant Distempers.

CHAP. III.

Of the Fleshy-part, and Blood of the Earth: Veins.

THE *Fleshy-part* of the Earth is that which we call the *Grand-Cover* of it; which consists of Clay, Gravel, Sand, &c. and is fed and nourish'd with Water, as the Flesh of Man and Beasts is with Blood. So that those *Sand-feeders*, and *Gravel-feeders*, which we meet with in this part, are to be esteem'd as bearing the same Offices, and having for the same Purposes, as the Blood in the Flesh of Man.

Now, whenever this mighty Animal is wounded in the Skin or Fleshy part, the Wounds are presently heal'd up by a Spirituous and Balsamick Ferment which circulates through all its Parts in the same manner as Nature plays the Chirurgeon in the Bodies of other Living Creatures.

CHAP. IV.

Of the several Kinds of Metals *and* Minerals, *(which are the* Bones *of this great Animal) their* Rise *and* Dibb, *&c.*

UNder the Flesh lye the Bones, that is, Stones, Metals and Minerals: All which the Miners have reduced to seven *Genera* or Kinds, containing under them as many subordinate *Species* as there are either of Vegetables or Sensitives upon the Earth's Surface.

Stones are either *Noble* or *Ignoble*: Whereof the Latter may be reckon'd in three *Classes*, as being either of a Quality.

{ Terrene.
{ Unctuous and Pinguid.
{ Hot and Sulphurous.

Those of an Earthly, Terrene Quality are of a hound Grit, which will not calcine; and are either Red, White or Mixt. The *Red Stone* hath its Colour either from the *Dog-cover*, or from *Ruddle*, or from the

Iron-stones, and these give the several Tinctures of Red, as Blood-red, Black-red, and Blew-red. The White and Mixt are of the same Grit and Nature with the former; but, lying deeper, are better digested and stronger. All these lead to an *Iron-stone*; which is the Perfection, or Quintessence of them.

The second Class is of such Stones as will calcine, as *Lime-stone*, *Marble*, and *Chalk*; which are of a smaller Grit than those of the first Kind. Under these lies often a grey Free-stone mixed with Sulphur, and spangled with a kind of Oar. And, under this, a grey Metal; which turns quickly into another fat and black one, and immediately leads to *Coal*, the Perfection of this Sort of Stones.

Those of a *Fiery* and *Sulphureous* kind are those the Miners call *Rake-stones*, being usually spangled with Sulphur, as the former are with Nitre. And these lead to Rakes or Veins of Oar, Gold, Silver, Lead, &c. All Stones of the same Grit claiming Affinity one with another, are nourished, and increase by an agreeable *Juxta*-position of Parts. So that, digging through the Day-cover, by the first Stone which lies true Dibb and Rise, you may easily discover what it will lead you to; whether *Coal*, *Iron*, or other *Metals*.

The more *Pretious* or *Noble Stones* differ in Quantity, Quality, Perspicuity, Softness, Hardness, Colour and Virtue, according to their several Temperaments and Modifications, and are reducible to three Kinds, as being either

1. Transparent
2. Resplendent
3. Opake.

The

The *Transparent* are Excrescences or Superfluities of Stones of a Fiery Nature; as Gums are of the natural Succus in several Trees of a hot Quality. The cause of their Transparency is their being of a watery substance *in esse primo*; and, by consequence, like Ice, wanting Colour: for the more colour'd any stone (even of the finest parts) is, the less transparent it must needs be; like Water tinctur'd with Black, Red and other Colours. The cause of their Hardness is their own natural heat meeting with the external heat of the Sun; which quickly ripens them into their several Degrees of Perfection.

The *Resplendent* are such as dart back and reflect Light with pleasure to the Beholder: and, in several of these, Nature may be well counterfeited by Art; as in the polishing of Marble, *&c.*

The most useful of all Snake-stones (which have the Honour to be esteem'd precious) is the *Load-stone*; which is commonly found in Iron-Mines, as Cat-heads are in Stone-metals: And, as these are the Kernels and Quintessence of Stone-metals, so is the Load-stone of the Iron. 'Tis *Multum in parvo*; for in it the Spirits of the whole Mine concenter; whence, continually emitting their *Effluvia*, they attract Iron by Sympathy. For, as the Roots of Plants have an attractive Faculty whereby they suck in their proper Nourishment, so is this stone furnish'd with the powers of drawing in Iron as its proper *Pabulum*. These Spirits seizing on a small Needle rightly temper'd, will not suffer that light Body to rest (whilst 'tis placed on a point upon an even Ballance) till it stand full North and South; which is the natural position of the Load-stone, and all other Earthy Metals and Minerals that lye true.

Metals

Metals are either such as are,

1. Properly, } so called.
2. Improperly, }

These latter are again divided into,

1. *Stone-Metal*; of a Nitrous and Saltish Quality; out of which Allum is drawn.
2. *Coal-Metal*; of a more Unctuous and Piggiud Nature.

Metals *properly so called*, are usually clas'd under seven *Genera*; being differenc'd one from another as they have more of Water or Quick-silver in them, than of Earth or Sulphur; or *vice versâ*. For Sulphur is the Male-parent (having much Heat and Fire in it) and Quick-silver the Female, in the production of all Metals.

Those that have more of Quick-silver than Sulphur in their Temperament are Gold, Silver, Tin and Lead, and these are transmutable, differing only in Degrees of Coction. Iron or Copper, Iron and Steel, have more of Sulphur: Which, being either White or Yellow, makes all Metals of one or other of these two Colours.

The intermedial Metals, or Minerals, which are neither true Metal nor Stone (but participate of the Nature and Qualities of both) are many; but the most principal of all are Salt, Nitre, Vitriol, Sulphur, Bitumen, Glass, Quick-silver, Spar and Allum.

All Metals and Minerals (in their main Bodies) lye upon Flats, like Leaves in a Book or the pielings

of

of an Onion; dibbing to the two Poles and rising towards the Æquator. From the latter part of this Rule there are indeed some Exceptions: As, 1. Where great Dykes incline them to the N.E. or N.W. 2. In flooded and broken Ground, upon the Skirts of great Mountains; where they lye confused with False and Counter-Dibbs, like Beards of Ice thrown up on the Banks of a River: which may probably be ascrib'd to the Devastations made by the General Deluge. 3. Upon the Coasts of the Sea or Main-Ocean; where they have their Dibb to the Sea, and Rise to the Shore: whereby Providence has not only design'd a Natural Concavity, fit to contain so large a Body of Water, but hath also wisely preserv'd the sweet Feeders (which circulate in the Veins of Metals and Minerals) from being corrupted and vitiated by the Intermixture of Salt-water.

CHAP. V.

Of Water and Mineral-feeders (the Earth's Blood) the Original of Springs, Hot-Baths, &c.

IN the Earth there is a constant Circulation of Water, as in other Animals of Blood; every particular Metal and Mineral having its proper Feeder, which, by thus circulating in it, preserves its Life, and carries in it the Spirit and Flavour of that Land to which it belongs: as may readily be distinguish'd, sometimes by the Taste, sometimes by the Colour; but, most

moſt commonly by its Effects and Operations. Hence proceeds the great Variety of *Medicinal Waters.*

Whenever it ſo happens that ſeveral of theſe Feeders, of different and contrary Qualities, break from their natural Metals or Minerals, as, Sulphur, Allum-roch, Iron-ſtone, Coal, &c. and meet together in one Stream, a ſtruggle or contention immediately ariſes among them; and the hot Spirits of Sulphur, Bitumen, &c. being moſt Active and Vigorous, prevail uſually over the cold Qualities of the other, and throw them into a boyling Ferment. And this is the true Cauſe of *Hot-Baths.*

Here it will not be amiſs to give ſome Account of the Original of *Springs*; which are neither the Off-ſpring of the Sea; nor are they occaſion'd by Air condens'd in the Caverns of Mountains; nor are they deriv'd from Rains or Dew; as ſeveral of the old Philoſophers have variouſly gueſs'd and fancy'd. Which will be ſufficiently apparent if we conſider what follows. And,

1. That they do not come from the Sea is evident from the natural Dibb of Metals into the Sea and their Riſe to the Shore; which makes it impoſſible for the Salt-water to penetrate them, or to break through thoſe *Kells*, or thin Beds of tough Clay, which lye betwixt the ſeveral Metals, and preſerve their Feeders from intermixing one with another. For, if we ſink a Pit upon the Sea-ſhore, and carry a Drift ſome hundreds of Yards under the Salt-water, we find ſtill the na-

tural Feeders of Coal or Stone without the least mixture of Salt.

2. If Springs were occasion'd by Air condens'd in the Bowels of Mountains, then in Summer they would over-flow and be more Rapid than in Winter. For, in Summer, under-ground Cold is more strong and piercing, and should (consequently) condense more Vapours, and so increase the Fountains: and, in Winter, the heat under-ground is more Active and Vigorous, and therefore ought (then most especially) to rarify the Vapours into Smoak and Mist, and thereby cause all Springs to be weak and feeble.

3. That they owe not their Original to the Dews or Rain should be (methinks) evident to the Eyes of all men; who will never be able to observe any of those which we call *Perennial Fountains* to flow either more or less upon the greatest Floods that happen. For the Rains (which are drawn up in Vapours, by the Sun's influence, from the Sea; and afterwards, being condens'd in the Air, drop down in Showers) do onely moisten and refresh the outward Skin and Surface of the Earth; and descend no further than is requisite for the necessary Sustenance of Plants, and for the supplying the common occasions of Man and other parts of the sensitive World.

It remains therefore that Fountains must have some other Original than has hitherto been assign'd them; and this (to me) appears no where more probably to be sought for than amongst the sweet Feeders of Quarries, Mines, &c. Which possibly

possibly will be further evidenced by the Discoveries that the next Chapter will afford us.

CHAP. VI.

Of the Tapping of Feeders, Nature of Damps, Firing of Mountains, &c.

NOW, tho' the most rapid Springs do break out and flow from the tops of the highest Mountains, and thence become the Heads of the greatest Rivers in the world, yet these Springs may be drawn down, and the Mountains tapp'd and design'd, by Cross-cutting (with a Level-Drift) those Metals and Minerals, whose natural Feeders they are, and from whence they flow; and such Mountains, thus drawn dry, will fire of themselves. For the hot and fiery Spirits of Sulphur, together with the fat and unctuous ones of Bitumen and Coal (being now freed from the Shackles of the cool Feeders) uniting their forces, break out in Eruptions of Fire and Smoak; which has occasion'd all the wonders we read of, at Mount *Ætna* and other flaming Mountains.

The Reason why Springs or Feeders break out more frequently, and flow more Rapidly, from the tops and skirts of Mountains, than from the plain and level Ground, is chiefly to be ascribed to the natural Position of Metals, &c. which on the Plains have an easier Dibb and Rise (in many

places not exceeding a Yard at ten, upon the full Riſe) and therefore very rarely, in ſuch Grounds, appear at Day: whereas, on the Mountains, they commonly riſe a Yard at two (ſometimes a Yard at a Yard) and ſuch a Rank riſe muſt needs very quickly bring both them and their Feeders above ground. Beſides, the height of the Mountains expoſes them to the violence of Storms, Tempeſts and Thunder, which ſometimes break their Veins: but theſe Accidents ſeldom happen on the Levels, where the Earth's Grand-cover ſhelters both Metals and Feeders from ſuch violences. And thus in our own Bodies, 'tis much eaſier to break a Vein in the Neck or Arm, where they lye neareſt the Skin; than in the Buttocks, or any other ſuch Fleſhy-part.

In the digging for Water 'tis obſervable that, as ſoon as we prick any Metal lying upon the Dibb and Riſe, its Feeder will riſe as high as the full Riſe of that Metal: and if we dig thorough that into another Metal, we raiſe a ſecond Feeder, which will riſe a Degree higher in the Pit; and, by digging deep enough, we may bring the water to the Pit's mouth, which will ſave the Charge of Pumps.

Damps in Coaleries and other Mines proceed from the unctuous and fiery Spirits of Coal and Sulphur, which continually perſpire out of the Coal-wall; and theſe, being gather'd into a Body, like ſo many dry Exhalations in the Belly of a great Cloud, diſcharge themſelves in claps of Thunder, when fir'd either at a Candle, or by Clothing one againſt another. This the Colyers call

the

the *Fiery Damp*: and they usually discover its gathering together by the Candles burning blew, like flaming Brimstone, and the open Works being filled with the Smell of Sulphur. The way to prevent the Mischief of this Damp, is to hang a Grate of hot glowing Coals in the Middle of the Pit; which will presently draw and fire it, with little Damage or Danger.

Another *Damp* there is which proceeds from corrupt and stagnated Air, breaking forth out of old, crush'd and Smothered Works: And this is usually either prevented or cured by sinking a Pit upon the old Works, and thirling into the New; whereby the Air easily circulates and purges it self.

A Third *Damp* is produced sometimes in the freshest Works by some part of the Air, being too close pent up in odd Corners, and wanting a free Communication with the rest of its Body; and this (though of the same Nature with that last mention'd, yet) has no offensive Smell, like the former, but insensibly and suddainly stifles the Work-men. All Dangers of this kind may be avoided, by being at the Charge of a sufficient Number of Air-pits, and keeping the Thirlings clear and open.

CHAP. VII.

Of Dykes, Rakes, Veins, Strings, &c. which are the Nerves, Sinews and Ligaments, of this Animal.

THE Bones of the Earth, as well as those of the living Creatures that are bred and nourish'd by it, are bound together by Nerves and Sinews, and are moved by their proper Joynts: and these are they which are known to all Miners by the common Names of Dykes, Rakes, &c. And the natural Position of all these is from the Surface to the Center, dividing and cross-cutting all the fat Metals and Minerals.

Vide p. 19. d. infra.

Dykes are so called from Division or Inclosing: and these are either *Greater* or *Lesser*. The *Greater Dykes* are such as inclose a whole Field of Metals or Minerals; and divide it from Fields of another Species. The *Lesser* divide Metals or Minerals of the same kind, into several Partitions. The natural Use of both is to preserve the Feeders, and they may (not unduly) be compared to Knots in Grass or Corn; which strengthen it and preserve the Sap, wherein the Life of that Vegetable consists. For, whenever a Field of Coal breaks out upon the full Dib, it's commonly dead; till we cross-cut a Dyke, which preserves the Feeder or Life of it. Wherefore these *Dykes* (consisting of a Confusion of several Metals, mixt together irregularly, without any certain Dib or Rise) are to be esteem'd the *Joynts* of the Earth.

Rakes

Rakes, are so called from raking through (or cross-cutting) of Metals and Minerals of the same Kind or Species. In the middle of these there is always some metalline Vein or other, supported and secured by strong Sills or Sides; and this, when it abounds with any kind of rich Ore, is termed a *Quick-vein*; as, on the contrary, when it contains nothing but Spar or Sulphur, 'tis called a *Dead-vein*, or *Rake*.

The various Dispositions of these Rakes, their several Foldings and Turnings through almost every Part of the Earth's Body, shews that Nature has not only design'd them as proper *Matrices* or Beds for the Production of the several Sorts of Metals; but did also intend them as Strengtheners and Binders of the whole Frame, serving the same Use they do of a Regular or Irregular Figure; as in the following Scheme.

Nerves, Muscles, &c. do in our own Bodies.

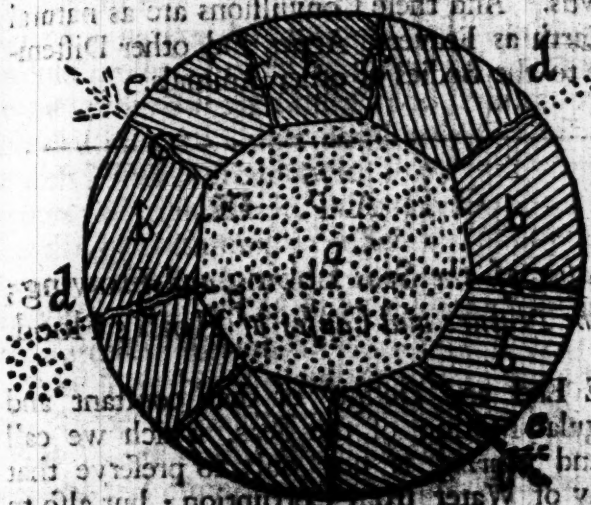
CHAP. VIII.

A Description of the Belly of the Earth, and what it may be supposed to contain; with an Enquiry into the Causes of Hurricanes *and* Earth-quakes.

THough the Poets usually represent those Treasuries of Nature, whence Riches and Metals are digg'd, as the innermost *Viscera Terræ*; yet Philosophers and Mathematicians, who consider how small a Proportion the deepest Shaft bears to the

the Diameter of the whole Earth, reflect on all the Works of Miners as Scratches rather in her Skin than Wounds in her Bowels. At least the Advances that have hitherto been made cannot be imagin'd to reach beyond the fleshy Part. So that (as Mr. *Boyle* and others have observ'd) the short Discoveries, which the imperfect Skill and Industry of Mankind have as yet arriv'd at, are nothing in comparison of what lies still hidden and in the Dark.

However, by that little which we have seen, we may be allow'd to make a Conjecture at the Nature of the *things that are not seen*. But (especially) the natural Position of most Minerals, lying on a flat one above another, with a Dib and Rise, must unavoidably incline us to believe that in the Middle of the Earth there is a vast Cavity, or Hollow, of a Regular Multangular Figure; as in the following Scheme.



Wherein we suppose the mighty Space about *a* to be fill'd up with a crude and undigested Matter, endued with several Motions, and contrary Qualities, which are in a continual Struggle and Contention among themselves. Above these we have the Crust, or fleshy Part of the Earth, made up of the several Layers or Foldings of Stone, Minerals, &c. as *b b b b*, together with the Dykes and Rakes (or Sinews and other Ligaments) at *c c c*. Now, when in the Intestine War below, the Airy Particles prevail, they break through the Joynts of the Earth in *Hurricanes*, as at *d d*. And when (on the contrary) the fiery Particles are predominant, they force their Passage the same way, as at *e e*, causing *Earthquakes*; sometimes with that Violence as to break

the very Ribbs of the Earth, ſwallowing up Houſes and Towns. And theſe Convulſions are as natural to the Earth as Feavers, Agues and other Diſtempers, are to the Bodies of other Animals.

CHAP. IX.

The Reaſon of the Seas Ebbing and Flowing; and the Nature and Cauſes of Noah's Flood.

THE End and Deſign of that conſtant and regular Motion of the Seas, which we call *Ebbing* and *Flowing*, is not only to preſerve that vaſt Body of Water from Corruption; but alſo to produce a ſeething Heat and Fermentation, whereby Vapours and Exhalations are raiſed and ſent abroad. Theſe being afterwards drawn up, by the Sun's Influence, as high as the middle Region of the Air, they are there condens'd into Clouds: which ſwim upon the Air, until (ſinking gradually by their own Weight) they again deſcend in Showers.

The Cauſe of this *Ebbing* and *Flowing* is now to be aſcribed to the Moon; nor to any other External Agent. For though it keeps time with the Moon's Motion in its Increaſe and Decreaſe; yet from hence it ought no more to be argu'd that the Moon contributes to the Sea's Motion, than it is reaſonable to conclude that one Man is the Cauſe of another's Running, who runs the ſame Race with him Shoulder by Shoulder, and Foot by Foot.

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The *Ebbing* therefore and *Flowing* of the Sea is its own natural Motion; which, being circular, would presently carry it round the Earth's Globe, were not its Strength lessen'd and impair'd by being divided into the Upper and Lower-waters. Nevertheless, it endeavours twice in every Twenty Four Hours to complete its Motion, and overflow the Earth: but, wanting a Sufficiency of Strength, and being beaten back by the Banks of the Sea (occasion'd by the Dib of all Metals into it) 'tis as often forced to retreat.

Yet, if it should please God once more to unite the Upper and Lower-waters (as in the Days of *Noah*) they would again be able to perfect their natural and circular Motion; and so cause another Universal Deluge.

CHAP. X.

Of the Diurnal Motion of the Earth.

AS all other Creatures, that have in them a Principle of Life, have also a Principle of Motion and Self-activity; so has also this great Animal (the Earth) its natural Motion, whereby it turns round upon its own Center once in every twenty four Hours; exposing continually its cold Sides to receive the warm Influence of the Sun, and the rest of the Æthereal Bodies.

And it may be concluded, from Arguments of the greatest Probability, that this *Diurnal Motion of the Earth*, is caused by that vast Quantity of confus'd and undigested Matter, which is contained, and imprison'd in the *Belly of it*: For this Matter, consisting most of hot and fiery Particles, and such as are of an active and volatile Nature and Quality; which cannot rest, nor be fixt *in Loco*, must of necessity move in a regular and perpetual *Round or Circle*, by which Motion it may rationally be suppos'd, that they carry about with them the Shell, or Body of the Earth; and that the Violence, and Rapidity of their Motion, might not set the Earth on fire, God has hamperd those brisk and active Particles, with others of a more dull, and heavy Nature.

And by thus ballancing and counterpoysing of those contrary *Qualities* of Heat and Cold, Siccity and Humidity, Gravitation and Levity, *The Motion of the Earth*, is not only made constant, regular, and uniform, but it is so firmly fixed upon its Center, that it is as impossible for it to move higher, or lower, as it is for the heaviest Rock to ascend, or the most nimble, and active Fire to descend.

Thus, as the Animal and Vital Spirits, which flow from the Heart, and by a constant Circulation through the *Veins, Nerves, and Arteries*, give Life and Motion to our Bodies; so these fatal subterranean Spirits, whose principal Residence is in the *Center of the Earth*, diffusing themselves through the *Veins, Nerves, and Arteries* of it, gives not only motion to the whole Body; but by

by their vital Heat, ripens and digests those *Metals, Mines, and Minerals*, (which are the Constitutive parts of it) into their several Degrees, of Concoction, and Perfection.

That the Earth moves was the Opinion of some of the old Philosophers, as *Pythagoras*, *Democritus* and others; and that Hypothesis being reviv'd by *Copernicus*, is now agreed to by all (or most) of the Moderns. And 'tis the more readily embraced, because 'tis not onely back'd with great strength of Reason (not to say Demonstration) but also removes the many gross Absurdities which clogg'd the contrary Opinion. For instance, what more ridiculous than to suppose the fix'd Stars to move (as *Clavius* computes the matter) no less than 176660 Miles in the 246th part of an hour? Or, what (on the other hand) more agreeable to common Sense than to believe that Divine Providence has communicated such a Motion to the Earth, as will most readily solve all the *Phænomena* of the Heavenly Bodies in their suppos'd Motions?

About the Earth would the Waters circulate; were not (as we have already observ'd) their strength and vigour abated by their Division. Round the Terraqueous Globe therefore moves the Aerial Region, or the Atmosphere; and above that, the Moon: which is next Neighbour to this Animal, and its near Relation; being constituted of the same condens'd matter, but of a more cold and waterish Quality.

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The Moon is indeed, in many particulars, very kind and serviceable to the Earth. Not only by returning to it (at second hand) that Light which it self does but borrow from the Sun; but also by repelling and beating down those Vapours and Exhalations which arise from the Sea, and there by comforting and refreshing its weary and dry parts.

This cold Constitution of the Moon is the more discernable by us when she is in the Full. For then the Sun's *Beam* of Light, being thence darted back to us in a streight Line, brings with them some of the Moon's Moisture; in the same manner as a Tennis-Ball, rebounding from a whited Wall, brings to our hand part of the Colour with it. And this is the Reason why we have the greatest Rain-Floods and Dews in the Full of the Moon; and why also, at that time, the most Brains of such Madmen as (for this Reason) we call Lunaticks are most undisturbed.

Every of these particulars might be further inlarg'd on. Thus far the Reader is only entertained with a rude Draught, and the first Lines of a new Hypothesis; which (if these Features take) may easily have its Proportions fill'd up, and be drawn at full length hereafter.

FINIS.